REMARKS

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 1, 2, 4-6 and 8 are now present in the application. Claims 1 and 5 have been amended. Claims 1 and 5 are independent. Reconsideration of this application is respectfully requested.

Claim Rejections under 35 U.S.C. § 103

Claims 1, 2, 4-6 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee, "Fast head modeling for animation", in view of Migdal, U.S. Patent No. 6,208,347. This rejection is respectfully traversed.

Independent claim 1 recites a combination of steps including "(a) inputting original 3D model data; (b) drawing 3D feature-lines according to the original 3D model data and user requirements; (c) converting the 3D feature-lines into continuing 3D threads, wherein the 3D threads are composed of connection joints, connection lines, and loops, wherein the connection joints are intersection points of the 3D feature-lines, the connection lines are the 3D feature-lines between two connection joints, and the loops are closed zones constructed by the connection lines; (d) determining a number of sample points on each connection line, adding or deleting the loops from the user, and outputting the 3D threads; (e) producing a regular triangular grid sample model according to the continuing 3D threads; (f) projecting the regular triangular grid sample model into the original 3D model to produce a reconstructed 3D model; and (g) redetermining the number of the sample points on each

connection line, readding or redeleting the loops, and repeating steps (e) and (f) if the reconstructed 3D model does not satisfy resolution requirements from the user, and outputting the reconstructed 3D model if the reconstructed 3D model satisfies the resolution requirements, wherein the sample points for the reconstructed 3D model are located on the connection lines despite of the number of the sample points."

Independent claim 5 recites a combination of steps including "inputting original 3D model data; drawing 3D feature-lines according to the original 3D model data and user requirements; converting the 3D feature-lines into continuing 3D threads, wherein the 3D threads are composed of connection joints, connection lines, and loops, wherein the connection joints are intersection points of the 3D feature-lines, the connection lines are the 3D feature-lines between two connection joints, and the loops are closed zones constructed by the connection lines; determining a number of sample points on each connection line, adding or deleting the loops, and outputting the 3D threads; producing a regular triangular grid sample model according to the 3D threads; projecting the regular triangular grid sample model into the original 3D model to produce a reconstructed 3D model; outputting the reconstructed 3D model, wherein the sample points for the reconstructed 3D model are located on the connection line despite of the number of the sample points."

Applicants respectfully submit that the above combinations of steps as set forth in independent claims 1 and 5 are not disclosed nor suggested by the references relied on by the Examiner.

The Examiner alleged that Lee in Section 2.2.1 teaches the step of "drawing 3D feature-lines according to the original 3D model data and user requirements" as recited claims 1 and 5. However, Lee in Section 2.2.1 simply discloses that *the correspondence between control points on a generic model and feature points on pictures* is obtained, which is not synonymous with the feature of "drawing 3D feature-lines according to the original 3D model data and user requirements" as recited claims 1 and 5.

In addition, the Examiner alleged that Lee moves a few points to the corresponding position interactively, and anchors them to keep the structure of points when snakes are involved. Accordingly, the feature points are moved and anchored to corresponding position for later use. In addition, Lee teaches deforming (modifying) a generic model using the feature points. In other words, Lee simply discloses that the feature points are anchored (fixed) and the given generic model is deformed using these feature points. Lee nowhere teaches or suggests the reconstruction of a regular 3D model from an original 3D model as recited in claims 1 and 5. Unlike Lee, in the claimed invention as set forth in claims 1 and 5, the 3D feature-lines, the 3D threads, and the reconstructed 3D model reside in the same grid model surface, and the number of sample points is adjustable. These features are clearly absent from Lee.

Migdal also fails to cure the deficiencies of Lee. In particular, Migdal teaches a system and method for modeling 3D objects and 2D images by wireframe mesh constructions having data points that combine both spatial data and surface information such as color or texture data. The use of the complex data points (e.g., X, Y, Z, R, G, B in 3D and x, y, R, G, B in 2D) allows the modeling system to incorporate both the spatial features of the object or image as well as its

color or other surface features into the wireframe mesh. The 3D object models taught by Migdal do not require a separate texture map file for generating display or other object manipulations. In an exemplary embodiment, the mesh constructions taught by Migdal contain sufficient color information such that the triangles of the meshes can be rendered by any processor supporting linear or bilinear interpolation such as Gouraud shading. For 2D systems, the 2D mesh models created from the teachings of Migdal replace bitmap files and present a greater level of data compression and flexibility in image manipulation than is currently available in compression systems such as JPEG. In addition, the modeling system taught by Migdal has dynamic resolution capability, such that the surface details like color or texture can be rapidly added or subtracted from the model.

However, although Migdal provides a system and method for modeling 3D objects and 2D images by wireframe mesh constructions having data points that combine both spatial data and surface information such as color or texture data, the mesh construction taught by Migdal has nothing to do with the feature lines.

In the claimed invention, the reconstruction of a regular 3D model is built from the feature lines in an original 3D model. In addition, the reconstructed 3D model is locked in the same position despite of resolution changes. This feature is advantageous, for various applications utilize position information of the reconstructed 3D model for further editing and/or setting control points. Migdal does not teach or suggest a locked-position reconstructed 3D model, and does not provide the described benefits of the claimed invention.

In addition, as shown in FIGs. 1, 2a and 2b of Migdal, the 6D data points (original data points) are input to the computer system 3 for reconstruction. Although Migdal in col. 22, lines 38-47 discloses that the 6D data points can be added or removed, those data points are the *original* data points, not the *sample points* from any lines.

In fact, Migdal nowhere discloses obtaining any connection lines as recited in claims 1 and 5. Migdal simply teaches using more or less *original* data points to change the resolution, but fails to teach obtaining any sample points from a non-existing line. Therefore, Migdal also fails to teach "determining a number of sample points on each connection line" as recited in claims 1 and 5, which the Examiner has also correctly acknowledged that Lee fails to teach.

Accordingly, neither of the references utilized by the Examiner individually or in combination teaches or suggests the limitations of independent claims 1 and 5 or their dependent claims. Therefore, Applicants respectfully submit that claims 1 and 5 and their dependent claims clearly define over the teachings of the references relied on by the Examiner.

Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103 are respectfully requested.

CONCLUSION

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Cheng-Kang (Greg) Hsu, Registration No. 61,007 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By _____ #61007

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